

Does Exploitation Pay? Evidence from Better Work Vietnam

A thesis submitted by

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Abstract:

A burning question in the personnel economics literature is whether exploitation of workers is profitable. Using data collected by the Better Work Program in Vietnam, this research finds that exploitation as characterized by failure of management to pay workers as promised or use of abusive practices to elicit effort is not profitable. The findings stand both from the perspective of management and that of the workers.

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Chapter 1

Introduction

Jeffrey Sachs (2005) famously stated that, "My concern is not that there are too many sweatshops, but that there are too few." According to Sachs' line of reasoning, harsh conditions of work in developing country firms are the inevitable consequence of the fine division of labor common in the early stages of industrialization and worker preferences over the tradeoff between pecuniary and nonpecuniary compensation. In contrast, Sable et al (2000) argue that *sweatshops* are the product of deficient managerial capital common in developing countries. Factory managers, who lack knowledge of human resource management innovations that emphasize positive motivational techniques such as incentive pay, may resort to verbal and physical abuse to elicit work effort.

Indeed, Melitz (2003) and Verhoogen (2008) attribute differences in firm performance to cross firm heterogeneity in the skill set of managers. Evidence that factory managers in developing countries lack managerial capital that impact productivity is provided by Bloom et al (2012). Based on experimental evidence from textile firms in Delhi, managerial capital related to the most basic tasks such as inventory management were found to lower firm productivity.

However, in the management of labor, innovations that increase productivity do not necessarily translate into increased profits. Harsh treatment of workers, particularly young women of limited literacy and market experience, may allow a firm to set compensation below the marginal value product of labor, thereby extracting monopsonistic rents (Freeman and Kleiner, 2005). As a consequence, there exists a potential tradeoff between the efficiency benefits that arise when a factory manager employs high powered pay incentives and the loss of monopsonistic rents when a firm eliminates negative nonpecuniary motivational techniques. That is, factory managers who closely link compensation and work effort undermine attempts to extract monopsony rents through the use of abuse and deceptive pay practices.

Human resource management (HR) plays a vital role in overseeing a firm's workforce. According to Adler (1988) and Reich (1991), effective management of human capital, not physical capital, is the most important determinant of a firm's performance. Working conditions prevailing in a firm commonly referred to as *sweatshop* can be thought of as the outcome of the HR practices chosen by the firm.

Empirical evidence concerning the relationship between the choice of HR practices, productivity and profits is first provided by Ichniowski et al. (1995). Using an empirical technique called *Insider Econometrics*, they examine the effect that introducing new HR practices has on productivity and profitability in the US steel industry. Production lines that adopted the most innovative and cooperative HR practices experienced a seven percent increase in productivity as compared to lines that adopted the least innovative and cooperative practices. Moreover, the authors estimated that a one percent increase in productivity leads to a \$27,900 increase in profits.

More careful analysis is undertaken by Bandiera et al. (2007). Using an experimental frame, they investigate the impact of a switch to managerial performance pay in a fruit farm in the United Kingdom on labor force quality and productivity. The authors report that the introduction of managerial performance pay led to a 21 percent increase in the average productivity of the pickers and to a 38 percent increase in the cross-worker dispersion of productivity.

On a more granular level, previous research has also established the connections between the choice of HR practices, the positive impact on worker well-being and individual productivity. Schneider and Swan (1997) find that the tolerance of sexual harassment in the workplace negatively impacts the well-being of female employees. A lack of worker well-being leads to absenteeism and decreased morale. Finally, Brown et al. (2009) investigate the impact of treating anemia and intestinal parasites on productivity in apparel factories in Bangalore. They find that prior to treatment healthy and anemic workers were equally productive. However, following treatment, treated workers had productivity 6 to 8 percent higher than workers who were healthy prior to the intervention.

The link between incentive pay and productivity, based on an experimental approach provided by Bandiera et al (2007), is generally considered definitive. However the use of *Insider Econometrics* by Ichniowski et al (1996), identifying a link from HR innovations to profitability, has been challenged. Indeed, Freeman and Kleiner (2005) and Harrison and Scorse (2010) find that an *increase* in productivity is accompanied by a *decrease* in profits when the monopsony losses are larger than the efficiency gains of closely linking pay and work effort. Freeman and Kleiner (2005) report that productivity in a US shoe factory fell by six percent and profitability increased by 25 percent as a result of a switch from piece rate to hourly rate.

Similarly, Harrison and Scorse (2010) find a significant increase in wage and employment for foreign-owned exporting apparel, textile and footwear firms in Indonesia as a result of increases in the statutory minimum wage between 1992 and 1996. However, profits of firms differentially impacted by the minimum wage legislation declined. The combination of a rise in employment and a decline in firm profits following an increase in the minimum wage is a critical indicator of the presence of monopsonistic exploitation.

The purpose of this thesis is to test two hypotheses central to the question of the profitability of labor management innovations in developing country firms. Using data on labor management practices and firm performance of Vietnamese apparel firms, we jointly test for (1) the presence of cross-firm HR managerial heterogeneity and (2) the conjecture that firms with inferior managerial capital engage in harsher labor management practices and deceptive pay practices. Evidence that *sweatshop*-like conditions are the consequence of a deficit in labor management capital is provided if firms that choose harsh and deceptive labor management practices are also less profitable.

The innovation of this thesis stems from the fact that the data upon which it is based allows for inferences to be made about the information set of each firm. Data are available on the types of garments being manufactured by each firm and the list of customers of each firm. Hence, controlling for

product type and customer reputation allows the impact of working conditions on firm level profitability to be isolated.

Following the classification of working conditions used by Better Work Vietnam, this study identifies six distinct components of the HR system: *Compensation, Training, Abuse, Freedom of Association and Collective Bargaining, Occupational Safety and Health and Screening.*

The variables used in this study are generated from responses from four different surveys: the human resource manager's survey, the financial manager's survey, the general manager's survey and the workers' survey. The answers to questions related to working conditions are transformed into an index, which ranges from 0 to 100, before being aggregated into a heuristic index that represents the choice of HR system. Factor analysis is then applied to detect underlying correlations between the heuristic indices. The strongly correlated indices are then combined into a new set of HR system variables, referred to as the innovation variables. Employee wages and price of garments are also included as independent variables since they originate from the derivation of the regression equations from the translog profit function. The other control variables are a measure of economies of scale, the type of garment being manufactured, the reputation sensitivity of the buyer and the position of the firm along the supply chain.

The empirical results provide evidence of cross-firm heterogeneity in managerial quality and that higher quality managers choose more humane labor management practices and are more profitable. Further, the challenges of implementing HR innovations are a significant factor in deterring their adoption.

A review of the relevant literature is provided in Chapter 2. The theoretical foundation for the empirical analysis is presented in Chapter 3. The data is described in Chapter 4 and results are presented in Chapter 5. Conclusions and directions for further research are detailed in Chapter 6.

Chapter 2

Literature Review

Bandiera et al. (2007) investigated the impact of a switch to managerial performance pay on the mean and dispersion of productivity of fruit pickers on a farm in the United Kingdom. While the compensation scheme of managers changed in the middle of the year, pickers were paid on a piece rate basis year round. Bandiera et al. (2007) argue that the exogenous variation in managerial incentives, access to comprehensive personnel records and absence of attrition allows for the precise determination of the causal relationship between the change in the managerial compensation scheme and the productivity of fruit pickers. The authors find that the introduction of managerial performance pay leads to a 21 percent increase in the average productivity of the pickers and to a 38 percent increase in the dispersion of productivity across pickers. A closer look at individual productivity data reveals that the productivity of the most able workers increased significantly while that of other workers did not change. Such a finding indicated that managers were focusing their effort on the most productive pickers. The data also reveals a selection effect. Workers who had the highest productivity were more likely to be hired when the manager's compensation scheme is changed to performance-based pay. Over half of the increase in average productivity was attributed to managers selecting the best workers in an attempt to maximize their pay.

Ichniowski et al. (1995) examined the effect that introducing new HR practices has on productivity and profitability in the US steel industry. The new practices, which included improved communication with workers and extensive training, were divided into four categories from "least cooperative and innovative" to "very cooperative and innovative". Ichniowski et al. find that lines which adopted the most innovative and cooperative HR practices reported a productivity increase which was 7 percent higher than the lines which adopted the least innovative and cooperative HR practices. Moreover, each line which adopted more cooperative and innovative HR practices recorded larger

productivity relative to those which adopted less cooperative and innovative practices. The authors further estimate the impact of adopting new HR practices on one “small-scale line”. They found that a one percent increase in productivity leads to a \$30,000 increase in operating income and generates a profit of \$27,900. By aggregating the gains in profits for each line in a steel mill, Ichniowski et al. (1995) estimated the increase in firm level profitability in response to the introduction of more effective HR practices.

It is commonly argued that piece rate is the most efficient method of compensation in industries such as apparel and footwear. The dominance of piece rate is pay is a consequence of the fact that work effort is fully observable and, therefore, perfectly contractible. However, Freeman and Kleiner (2005) studied the case of an American shoe factory which switched from piece rate to the less efficient hourly rate in an attempt to survive fierce competition from its rivals. As is common practice, the change to time rate pay was accompanied by the introduction of other complementary HR practices including a new safety program and enhanced communication with workers. Freeman and Kleiner (2005) report that productivity fell by six percent as result of these changes. Management introduced time rates not to lower productivity but rather to decrease labor and material costs. This objective was achieved as illustrated by a substantial 16 percent decrease in the materials’ cost share of revenues. Overall, the cost savings associated with the change to time rate completely outweighed the loss in productivity and profits increased by over 25 percent. The authors also calculate the counterfactual profits of the shoe factory had it retained piece rate compensation. They find that profits would have been \$56,161 compared to the actual profit of \$64,714 under time rate. Freeman and Kleiner expose the tension that exists between efficiency losses and consumer surplus¹ by switching away from time rates.

¹ I call it consumer surplus and not monopsonistic gains as Freeman and Kleiner had not established that employment had also increased at the shoe factory as a result of the wage increase

Harrison and Scorse (2010) directly attribute the gain in profits to monopsonistic exploitation in their analysis of the impact of anti-sweatshop campaigns on wages and employment in the Indonesian textile, footwear and apparel (TFA) industries. The outrage focused on foreign-owned exporting TFAs, supplying global supply chains. As a result of intense external pressure, the Indonesian government quadrupled the nominal minimum wage and the firms operating within the country had to follow suit. The authors use a difference-in-difference approach to determine the impact of the anti-sweatshop campaigns. Harrison and Scorse compared wages pre- and post anti-sweatshop campaigns and found that foreign-owned and exporting TFA firms increased wages by 10 to 20 percent across Indonesia while wages in large foreign owned and exporting TFA plants grew by 30% relative to non TFA factories. Employment in TFA firms exporting and foreign-owned TFA plants increased employment by 300 to 400 workers more than in other plants. Harrison and Scorse also report that productivity rose and profits decreased. The three components required to establish monopsonistic exploitation are were all present in the authors' findings. Any efficiency gains from paying as promised were exceeded by larger losses in monopsony power.

Schneider and Swan (1997) analyze the impact of sexual harassment in the workplace on the job attitudes, job behaviors, psychological well-being and coping behaviors. Using data of nearly 800 female employees from two samples, the authors find that the experience of sexual harassment had negative outcomes for workers and firms. Based on previous literature which had documented some negative effects of harassment experiences, including decreased morale, increased absenteeism, decreased job satisfaction, emotional or physical distress such as nervousness, irritability, and anger, Schneider and Swan (1997) claim that their study was designed to focus primarily on the outcome. The authors categorize the outcomes based on (1) work attitudes (satisfaction with work), (2) work behaviors including work withdrawals (employees' attempt to segregate themselves from the immediate work

situation) and job withdrawals (departure from jobs, retirement) and (3) psychological outcomes (emotional distress).

The authors find that the women who had not been harassed and those who had experienced low, moderate and high frequencies of harassment could be ordered on the basis of both their job-related and psychological outcomes. The discriminant function analyses suggest that women who encountered high levels of harassment reported the worst job-related and psychological outcomes. Meanwhile, those who had not been harassed reported the least negative outcomes. Women with the experience of moderate harassment reported significantly worse outcomes than those women who had not been harassed. The discriminant function analyses for two samples yield statistical significance, with chi-squared accounting for more than 80 percent of the between-group variance. The study provides important evidence that sexual harassment encounters lead to negative outcomes in both job-related and psychological outcomes.

The work of Brown et al (2009) is based on the context of examining the role that buyers in global supply chains play in helping the labor management at vendors, where buyers represent retailers and distributors and vendors represent factories in developing countries. Specifically, the authors examine whether an implementation of medical treatment of disease leads to better quality of life for sick workers and increased worker productivity. The analysis documents the drug treatment and education program intervention targeting intestinal parasites and anemia at seven Bangalore apparel factories between July 2004 and March 2005. Using a difference-in-difference-in difference (DDD) estimator, the authors find that a full complement of medically appropriate treatment increased individual productivity of anemic workers by 6-8 percent compared to non-anemic workers. As 30 percent of workers in the study were anemic, treatment can be expected to increase the overall factory productivity by 2-3 percent. The finding that treating anemic workers significantly improved worker productivity has important implications for labor management.

Chapter 3

Theoretical Model

In order to test for the presence of managerial quality heterogeneity and its relationship to firm level profitability, I begin with a simple model of firm behaviour as it relates to the choice of HR system. The theoretical model is followed by the development of the regression equation.

3.1 *Modelling the Impact of the Firm's Choice of HR System on Profits*

Firms are assumed to be price-takers in the goods market. However, they may have some market power in the factors markets. The firm, then, maximizes profits

$$\Pi = pf[e(g(HRS))] - W(g(a)) - P_{HRS}HRS \quad (1)$$

where ' HRS ' is the vector of the firm's actions relating to the choice of HR system,

' g ' is the transmission function relating the firm's actions to improve working conditions as perceived by the workers,

' e ' is labor force effort,

' f ' is an unknown production function

' W ' is wage bill for the firm and

' $P_{HRS}HRS$ ' is the cost of providing work place amenities.

An action HRS typically falls into one of two categories. The action may relate directly to pay practices. In that case $W' > 0$ and $P_{HRS} = 0$. For example, improving communication relating to pay practices limits potential exploitative practices the firm can engage in. Thus, the firm's wage bill increases, W' is positive. Alternatively, an action HRS may involve providing a workplace amenity. In such cases, workers may accept a lower wage but the factory must incur cost $P_{HRS}HRS > 0$ to provide the amenity. As a consequence, the wage bill may shrink and firm expenditure may increase, $W' < 0$ and $P_{HRS} > 0$.

As usual, $f' > 0$. The production function is increasing in labor force effort. Labor force effort, itself, increases with improved working conditions, implying that $e' > 0$. However, an employee's perception of working conditions depends on the effectiveness with which the firm implements the HR system. $g' = 1$ only if workers fully perceive the factory's attempt to improve working conditions. The firm's manager chooses HRS to maximize profits given beliefs about the impact of any action HRS on the production process. That is, the firm's manager attempts to set

$$\frac{d\Pi_e}{dHRS} = pf'_e e'_e g' - w'_e g' - P_{HRS} = 0 \quad (2)$$

where the subscript e indicates the firm's expectation of the derivative. The term $pf'_e e'_e g'$ is the efficiency benefit of increasing the power of incentives, while $w'_e g'$ is the negative impact of increased worker agency that might accompany improved working conditions.

It is assumed that managers vary in their knowledge of the profit maximizing set of HR practices. Cross firm heterogeneity depends on the manager's understanding of how to optimally organize the work place. However, if manager perceptions of the derivatives f' , e' , g' and w' are incorrect, then in reality,

$$|pf' e' g' - w' g' - P_{HRS}| > 0 \quad (3)$$

In those cases, the firm's choice of HRS is not maximizing profits. For firms with perfect knowledge of f' , e' , g' and w' , equation (3) holds with strict equality. For firms with imperfect information of f' , e' , g' and w' , equation (3) holds with inequality. In principle, firms can make one of two possible errors. Firms can choose to do too little of action HRS . Doing more HRS would increase profits. If firms undervalue HRS , then

$$pf' e' g' - w' g' - P_{HRS} > 0$$

implying that

$$\frac{d\Pi}{dHRS} > 0 \quad (4)$$

when evaluated at the firm's current choice of *HRS*. Firms can also choose too much *HRS*. If firms overvalue *HRS* then

$$pf'e'g' - w'g' - P_{HRS} < 0$$

implying that

$$\frac{d\Pi}{dHRS} < 0 \quad (5)$$

when evaluated at the firm's choice of *HRS*. Collectively, (4) and (5) represent the first set of testable hypotheses.

Hypothesis 1: If there is cross-firm heterogeneity in information concerning the technology of working conditions and low information managers choose too little 'a' then

$$\frac{d\Pi}{dHRS} > 0$$

If, in fact, firms systematically choose too little *HRS*, it is interesting to consider the cause of the error in calculating the first order condition. It is possible that the firm under appreciates the impact of *HRS* on effort, *e*. However, it is more likely that there is an error in implementing the improvement in working conditions.

Consider how any action *HRS* is perceived by workers in a firm. Let $HRSW = g(HRS)$ be the workers' perception of an action *HRS* taken by the firm's manager. The impact on profits of changing *HRS*, as given by equation (2), will only coincide with the true impact on profits of a change in *HRS* if $g'=1$. That is, the worker perceives the same change in *HRS* as the manager. The impact on profits of a change perceived by the workers is given by

$$\frac{d\Pi}{dHRSW} = pf'e' - w' - P_{HRS} \quad (6)$$

If $g' < 1$ then $\frac{d\Pi}{dHRS} < \frac{d\Pi}{dHRSW}$

In fact, if g' close to zero, it is possible that $\frac{d\Pi}{dHRS} < 0$ and $\frac{d\Pi}{dHRSW} > 0$. That is, there may be improvements in HRS that would increase profits but are perceived by the manager as being profit-reducing because of a failure of implementation, which brings us to our second hypothesis.

Hypothesis 2: If firms choose too little a because changes in HRS are not effectively implemented then

$$\frac{d\Pi}{dHRSW} \geq \frac{d\Pi}{dHRS}$$

That is, a one unit change HRS as perceived by the worker increase profits more than a one unit change in HRS as perceived by the manager. Section 3.3 illustrates how each hypothesis can be expressed as a linear combination of parameters introduced in the derivation of the regression equations.

3.2 Deriving the Regression Equations from the Translog Profit Function

Hypotheses 1 and 2 are tested by estimating a translog profit function which is conditioned on choices made by the firm's manager. The purpose of conditioning profits on the HR system of the factory is to detect cross-firm variation in profits that is unrelated to output and input prices. The translog is a flexible functional form that does not impose restrictions on the profit function. As a consequence, profits can be estimated without an *ex-ante* knowledge of the structure of the production function.² A generalized function that expresses profits Π as a function of output prices p_i and factor prices w_j , conditional on the firm manager's information set I_k , can be written as:³

² A similar argument is used by Bitzan (1997) who estimates a translog cost function for the railway industry.

³ The notation used here follows Bitzan (1997).

$$\Pi(p_i, w_j; I_k) \tag{7}$$

Inferences about the information set can be made by observing the choice of HR system *HRS* that the manager makes. The generalized profit function is approximated by using the second order Taylor series expansion given below:

$$f(x) = f(b) + \sum_{i=1}^n \frac{1}{i!} f^{(i)}(b)(x-b)^i \tag{8}$$

The profit function is linearized using a Taylor series expansion centered around 0 as illustrated below:

$$\begin{aligned} \Pi(p_i, w_j, I_k) = & \frac{\Pi(p_i, w_j; I_k)}{0!} + \sum_i \frac{\Pi_{p_i}(p_i, w_j; I_k)(p_i)}{1!} + \sum_j \frac{\Pi_{w_j}(p_i, w_j; I_k)(w_j)}{1!} \\ & + \sum_k \frac{\Pi_{I_k}(p_i, w_j; I_k)(I_k)}{1!} + \sum_i \sum_m \frac{\Pi_{p_i p_m}(p_i, w_j; I_k)(p_i)(p_m)}{2!} \\ & + \sum_i \sum_j \frac{\Pi_{p_i w_j}(p_i, w_j; I_k)(p_i)(w_j)}{2!} + \sum_i \sum_k \frac{\Pi_{p_i I_k}(p_i, w_j; I_k)(p_i)(I_k)}{2!} \\ & + \sum_j \sum_n \frac{\Pi_{w_j w_n}(p_i, w_j; I_k)(w_j)(w_n)}{2!} + \sum_j \sum_i \frac{\Pi_{w_j p_i}(p_i, w_j; I_k)(w_j)(p_i)}{2!} \\ & + \sum_j \sum_k \frac{\Pi_{w_j I_k}(p_i, w_j; I_k)(w_j)(I_k)}{2!} + \sum_k \sum_p \frac{\Pi_{I_k I_p}(p_i, w_j; I_k)(I_k)(I_p)}{2!} \\ & + \sum_k \sum_i \frac{\Pi_{I_k p_i}(p_i, w_j; I_k)(I_k)(p_i)}{2!} + \sum_k \sum_j \frac{\Pi_{I_k w_j}(p_i, w_j; I_k)(I_k)(w_j)}{2!} \end{aligned} \tag{9}$$

Equation (9) can be simplified by applying Young's theorem. Detailed steps are provided in section A of the appendix.

$$\begin{aligned}
\Pi(p_i, w_j, I_k) = & \Pi(p_i, w_j; I_k) + \sum_i \Pi_{p_i}(p_i, w_j; I_k)(p_i) + \sum_j \Pi_{w_j}(p_i, w_j; I_k)(w_j) \\
& + \sum_k \Pi_{I_k}(p_i, w_j; I_k)(I_k) + \sum_i \sum_m \frac{\Pi_{p_i p_m}(p_i, w_j; I_k)(p_i)(p_m)}{2} \\
& + \sum_j \sum_n \frac{\Pi_{w_j w_n}(p_i, w_j; I_k)(w_j)(w_n)}{2} + \sum_k \sum_p \frac{\Pi_{I_k I_p}(p_i, w_j; I_k)(I_k)(I_p)}{2} \\
& + \sum_i \sum_k \Pi_{p_i I_k}(p_i, w_j; I_k)(p_i)(I_k) + \sum_i \sum_j \Pi_{p_i w_j}(p_i, w_j; I_k)(p_i)(w_j) \\
& + \sum_j \sum_k \Pi_{w_j I_k}(p_i, w_j; I_k)(w_j)(I_k)
\end{aligned} \tag{10}$$

Taking the log of both sides of the Taylor series equation (10), replacing partial derivatives of the profit function with parameters⁴ and placing the remainder in the error term generates the following translog profit function:

$$\begin{aligned}
\ln \Pi = & \alpha_0 + \sum_i \sigma_i \ln(p_i) + \sum_j \beta_j \ln(w_j) + \sum_k \lambda_k \ln(I_k) + \frac{1}{2} \sum_i \sum_m \gamma_{im} \ln(p_i) \ln(p_m) + \\
& \frac{1}{2} \sum_j \sum_n \tau_{jn} \ln(w_j) \ln(w_n) + \frac{1}{2} \sum_k \sum_p \phi_{kp} \ln(I_k) \ln(I_p) + \sum_i \sum_k \psi_{ik} \ln(p_i) \ln(I_k) + \\
& \sum_i \sum_j \nu_{ij} \ln(p_i) \ln(w_j) + \sum_j \sum_k \kappa_{jk} \ln(w_j) \ln(I_k) + \varepsilon
\end{aligned} \tag{11}$$

Terms generated from expansion of the translog profit function are simplified to accommodate specificities of the dataset and address research question:

- Output price p is not disaggregated at the product type level. An average price per piece of garment is calculated and assumed not to vary within firm. $p = \text{revenue/output}$
- Wages vary across employee positions but this is not reflected in the regression equations as the objective of this research is to determine whether exploitation of workers, regardless of their position within the firm, is profitable.

Hence, the regression equations from Chapter 4 are of the form:

⁴ Each parameter is defined as the partial differential of the subscript of that particular parameter with respect to the generalized profit function from (7).

$$\ln \Pi = \alpha_0 + \sigma \ln(p) + \beta \ln(w) + \sum_k \lambda_k \ln(I_k) + \frac{1}{2} \gamma [\ln(p)]^2 + \frac{1}{2} \tau [\ln(w)]^2 + \frac{1}{2} \sum_k \sum_p \phi_{kp} \ln(I_k) \ln(I_p) + \sum_k \psi_k \ln(p) \ln(I_k) + \nu \ln(p) \ln(w) + \sum_k \mu_k \ln(I_k) \ln(w) + Z + \varepsilon \quad (12)$$

where Z is a vector of firm controls including the type of product being manufactured, the reputation sensitivity of firm's customer, the position of the firm along the supply chain and a measure of economies of scale.

3.3 Testable Hypotheses

As mentioned previously, the choice of human resource management system HRS is the realization of the information set I_k of the firm's manager. HRS can be measured along 6 dimensions, $HRS_1 - HRS_6$. The manner in which workers perceive the actions of the firm's manager is captured by the variables $HRSW_1$ to $HRSW_6$.

$$\begin{aligned} \ln \Pi = & \alpha_0 + \sigma \ln(p) + \beta \ln(w) + \lambda_1 \ln(HRS_1) + \lambda_2 \ln(HRS_2) + \lambda_3 \ln(HRS_3) + \lambda_4 \ln(HRS_4) \\ & + \lambda_5 \ln(HRS_5) + \lambda_6 \ln(HRS_6) + \frac{1}{2} \gamma [\ln(p)]^2 + \frac{1}{2} \tau [\ln(w)]^2 + \\ & + \frac{1}{2} [\phi_{12} \ln(HRS_1) \ln(HRS_2) + \phi_{13} \ln(HRS_1) \ln(HRS_3) + \phi_{14} \ln(HRS_1) \ln(HRS_4) \\ & + \phi_{15} \ln(HRS_1) \ln(HRS_5) + \phi_{16} \ln(HRS_1) \ln(HRS_6) + \phi_{23} \ln(HRS_2) \ln(HRS_3) \\ & + \phi_{24} \ln(HRS_2) \ln(HRS_4) + \phi_{25} \ln(HRS_2) \ln(HRS_5) + \phi_{26} \ln(HRS_2) \ln(HRS_6) \\ & + \phi_{34} \ln(HRS_3) \ln(HRS_4) + \phi_{35} \ln(HRS_3) \ln(HRS_5) + \phi_{36} \ln(HRS_3) \ln(HRS_6) \\ & + \phi_{45} \ln(HRS_4) \ln(HRS_5) + \phi_{46} \ln(HRS_4) \ln(HRS_6) + \phi_{56} \ln(HRS_5) \ln(HRS_6)] \\ & + \psi_1 \ln(p) \ln(HRS_1) + \psi_2 \ln(p) \ln(HRS_2) + \psi_3 \ln(p) \ln(HRS_3) + \psi_4 \ln(p) \ln(HRS_4) \\ & + \psi_5 \ln(p) \ln(HRS_5) + \psi_6 \ln(p) \ln(HRS_6) + \mu_1 \ln(HRS_1) \ln(w) + \mu_2 \ln(HRS_2) \ln(w) \\ & + \mu_3 \ln(HRS_3) \ln(w) + \mu_4 \ln(HRS_4) \ln(w) + \mu_5 \ln(HRS_5) \ln(w) + \mu_6 \ln(HRS_6) \ln(w) \\ & + \nu \ln(p) \ln(w) + Z + \varepsilon \end{aligned} \quad (13)$$

The hypotheses are tested for each of the six HR system. The linear combination of parameters which makes up Hypothesis 1 for HR_1 is presented below. This can easily be extended to HR_2 - HR_6 .

$$\begin{aligned}
& \text{Hypothesis 1: } \frac{d\Pi}{dHRS} > 0 \\
& \Rightarrow \lambda_1 + \frac{1}{2}[\phi_{12} \ln(\overline{HRS}_2) + \phi_{13} \ln(\overline{HRS}_3) + \phi_{14} \ln(\overline{HRS}_4) + \phi_{15} \ln(\overline{HRS}_5) \\
& + \phi_{16} \ln(\overline{HRS}_6)] + \psi_1 \ln(\bar{p}) + \mu_1 \ln(\bar{w}) > 0
\end{aligned}$$

The overbar on variables HRS , p and w indicates that the mean value of those variables is used in the hypothesis test.

Equation (13) can also be used to estimate the impact of implementing new HR system on profits, as perceived by the workers $HRSW$.⁵ Hypothesis 2, expressed in terms of its parameters, is given below for $HRSW_1$.

$$\begin{aligned}
& \text{Hypothesis 2: } \frac{d\Pi}{dHRSW} \geq \frac{d\Pi}{dHRS} \\
& \Rightarrow \lambda_1^w + \frac{1}{2}[\phi_{12}^w \ln(\overline{HRSW}_2) + \phi_{13}^w \ln(\overline{HRSW}_3) + \phi_{14}^w \ln(\overline{HRSW}_4) + \phi_{15}^w \ln(\overline{HRSW}_5) \\
& + \phi_{16}^w \ln(\overline{HRSW}_6)] + \psi_1^w \ln(\bar{p}) + \mu_1^w \ln(\bar{w}) \geq \\
& \lambda_1 + \frac{1}{2}[\phi_{12} \ln(\overline{HRS}_2) + \phi_{13} \ln(\overline{HRS}_3) + \phi_{14} \ln(\overline{HRS}_4) + \phi_{15} \ln(\overline{HRS}_5) \\
& + \phi_{16} \ln(\overline{HRS}_6)] + \psi_1 \ln(\bar{p}) + \mu_1 \ln(\bar{w})
\end{aligned}$$

The hypothesis tests are carried out in Chapter 5. The next section describes the data collection process, the variables used and the manner in which the HR system variables are created.

⁵ The superscript w on the parameters and the use of variables $HRSW$ instead of HRS are the only differences between the estimation equation from the perspective of management and that of the workers.

Chapter 4

Data

4.1 *Data Collection*

The data used in this thesis were collected as part of the Monitoring and Evaluation of the Better Work program in Vietnam. Better Work is a joint initiative of the International Labor Organization (ILO) and the International Financial Corporation (IFC). According to Better Work Vietnam's third compliance synthesis report, "[t]he program aims to improve competitiveness in the apparel industry by enhancing economic performance at the enterprise level and by improving compliance with Vietnamese labor law and the principles of the ILO Declaration on Fundamental Principles and Rights at Work."

Data on factory characteristics, factory performance and workplace practices were collected using the Computer Assisted Personal Interview methodology (CAPI). Surveys for the General Manager, Financial Manager, Industrial Engineer and Human Resource Manager were delivered using netbooks. Data on worker characteristics, factory characteristics, workplace practices, hours, compensation, worker mental and physical health and human development characteristics were collected by Audio Computer Assisted Self-Interview methodology (ACASI). The worker survey was also coded into a netbook.⁶

The surveyed garment factories were from Ho Chi Minh City and its neighboring provinces. The first round of data collection started in January 2010 and was completed in August 2011. The second round of data collection is ongoing. The two interventions are usually carried out within a one-year period. The dataset contains 71 factories of which 15 have been surveyed twice. A random sample of 30 workers is selected in each factory and invited to participate. In addition to those 30 workers, an additional 30 workers are randomly chosen to be alternates. They are asked to fill in for selected workers who are unavailable at the time of the survey. The survey begins with informed consent.

⁶ This paragraph was based on the data collection section of "Measuring the Impact of Better Work 5 Oct 2011" by Brown et al. (2011b).

Individuals being surveyed are also allowed to skip questions should they decide not to answer or are not sure of the answer.

4.2 Constructing Working Condition Variables

Two approaches are used to construct the independent variables that represent the firm's choice of human resources systems. The first step is to construct heuristic aggregates of HR system components. These heuristic aggregates can themselves be elements of a broader HR system. However, principal component analysis can be applied to these heuristic aggregates to detect underlying factors or overarching HR systems. Evidence on the choice of HR system components can be obtained from the survey of HR managers, the survey of workers or the compliance assessments conducted by Better Work. That is, the independent variables representing working conditions can be generated from the perspective of management by using data from the HR manager's survey, from the perspective of the workers using data from the worker survey or from the enterprise advisor's point of view using enterprise assessment data. For the purposes of this thesis, only the perspective of the HR manager and workers are employed. Analysis of the compliance assessments will be a subject of future research.

To begin the heuristic step in constructing the aggregates, questions from the HR manager and worker surveys are classified into six broad categories established by the ILO. Only categories that are common to both surveys are included. These six categories are Compensation, Training, Abuse, Freedom of Association & Collective Bargaining and Occupational Safety & Health and Screening. A detailed description of each of these six categories follows and the list of questions from each category is provided in section B of the appendix.

4.2.1 Compensation

The questions in the *compensation* aggregate fall into 4 clusters. The first cluster includes questions evaluating whether workers or their HR manager believes that workers are concerned about a low piece rate, excessive deductions or late payment of wages. The second cluster covers questions related to the dong denominated value of worker wages and their TET bonus⁷. Benefits related questions are aggregated in the third cluster and they inquire about non pecuniary compensation provided by the employer. Questions inquiring about opportunities for promotions are aggregated in the fourth cluster.

The *compensation* aggregate for the worker survey differs slightly from that of the HR survey in that the fourth cluster for the former is financial independence, not promotions. Questions about financial independence try to determine if a worker's compensation is sufficient or whether the worker has to rely on the family for additional financial support.

The *compensation* index is the sum of the index across each of the four *compensation* sub clusters. Table 1 summarizes the *compensation* sub clusters for the worker and the HR survey.

Table 1: Compensation Cluster

Compensation Sub Cluster	HR Survey	Worker Survey
Pay Practices	X	X
Monetary Compensation	X	X
Benefits	X	X
Promotions	X	
Financial Independence		X

4.2.2 Training

Questions from the HR survey that are classified in the *training* category ask about the different topics that were discussed during the worker's induction training, the amount the time spent on basic skill training and the length of time spent on training new employees with previous work experience in

⁷ A TET bonus is usually distributed to workers before the Vietnamese Lunar New Year.

the apparel industry. Similarly, the *training* related questions from the worker survey seek to determine whether workers have received training during the first month on the job and the type of training they have received.

4.2.3 *Abuse*

Both the HR and the worker survey contain questions inquiring about the level of concern that workers express with regards to verbal abuse, physical abuse and an inaccurate punch clock. An inaccurate punch clock incorrectly records the working hours of employees, often forcing them to work unpaid overtime. Additionally, the worker survey inquires about harsh treatments including the inability to take bathroom breaks and water breaks as needed.

4.2.4 *Freedom of Association and Collective Bargaining*

The HR survey seeks to determine whether the factory has a collective bargaining agreement, a trade union representative or any type of worker committee. Follow-up questions ask about the effectiveness of the trade union representative and worker committee at resolving conflicts between managers and workers. The worker survey also investigates the existence of a collective bargaining agreement and the ease with which workers are able to seek help from the trade union representative.

4.2.5 *Occupational Safety & Health*

Both the HR and worker survey ask the same questions about the level of concern amongst workers regarding the factory temperature, potential for accidents or injuries and bad chemical smells that linger around.

4.2.6 *Screening*

The HR manager survey contains a set of questions which attempt to determine how rigorous the firm is in screening prospective sewers and supervisors and whether workers are asked to take tests before they are promoted. The worker survey inquires about the highest level of education completed by the workers and subsequently asks them to rate their skill levels.

4.3 *Heuristic Index Methodology*

Now that the categories representing the different HR system components have been introduced, the next step is to illustrate how the heuristic indices are constructed from answers to the survey questions. Each aggregate index takes on values 0 to 100, with 0 being poor working conditions and 100 being excellent working conditions.

An example is provided for each question type to illustrate the way the answers are assigned an index value.

- i. Type 1: Yes/No questions:
 - Example: Does this factory have a health clinic?
 - Yes (Weight= 100)
 - No (Weight= 0)
- ii. Type 2: Multiple choice questions with mutually exclusive answers:
 - Example: How satisfied are you with food in the canteen?
 - 1. Very satisfied (Weight = 100)
 - 2. Somewhat satisfied (Weight = 66.7)
 - 3. Somewhat unsatisfied (Weight=33.3)
 - 4. Not satisfied at all (Weight = 0)
- iii. Type 3: Open-ended questions:
 - Example: How much money do you usually receive when you get paid?

To transform the wage into an index, the worker’s wage is divided by the largest reported wage and multiplied by 100.

The question with mutually exclusive answers presented above was coded as a single variable in the survey program. Other multiple choice questions with non-mutually exclusive, have each answer coded as an individual binary variable. The index is then calculated as a weighted average of the various binary variables.

- Type 4: “Check all that apply” questions for which answers are weighted equally:
 - Example: Check all the facilities that are available in this factory:

1. Canteen	v1	100/5=20
2. Dormitory	v2	100/5=20
3. Child Care Nursery	v3	100/5=20
4. Library	v4	100/5=20
5. Sports facilities	v5	100/5=20

- $facilities = (v1+v2+v3+v4+v5) \times 100/5$

- Type 5: “Check all that apply” questions for which answers are NOT weighted equally:
 - Example: Is the piece rate a concern for workers in this factory?

1. No, not a concern	v1	1
2. Yes, discussed with co-workers	v2	6/7
3. Yes, discussed with supervisor	v3	5/7
4. Yes, discussed with trade union representative	v4	4/7
5. Yes, considered quitting	v5	3/7

6. Yes, threatened a strike	v6	2/7
7. Yes, caused a strike	v7	1/7

- $Piece\ rate\ concern = 100 * (v1 + v2 * \frac{6}{7} + v3 * \frac{5}{7} + v4 * \frac{4}{7} + v5 * \frac{3}{7} + v6 * \frac{2}{7} + v7 * \frac{1}{7}) / 4$

For purposes of illustration, the index for the HR system variable “abuse” is constructed below.

Workers are asked 5 questions in this category. The following set of answer choices belong to questions

(i) to (iii):

The answer possible answers are : 1) No, not a concern 2) Yes, discussed with co-workers 3) Yes, discussed with supervisor 4) Yes, discussed with trade union representative 5) Yes, considered quitting 6) Yes, threatened a strike 7) Yes, caused a strike

“No, not a concern” is given a weight of 1 while “Yes, caused a strike” is given a weight of 1/7, with intermediate answers weighed at increments of 1/7. For each question, the index is constructed using the following formula:

i. Is an inaccurate punch clock a concern for workers in this factory?

$$\text{clock concern} = 100 * (1 * v13 + \frac{6}{7} * v14 + \frac{5}{7} * v15 + \frac{4}{7} * v16 + \frac{3}{7} * v17 + \frac{2}{7} * v18 + \frac{1}{7} * v19) / 4$$

ii. Is verbal abuse a concern for workers in this factory?

$$\text{verbal abuse concern} = 100 * (1 * v20 + \frac{6}{7} * v21 + \frac{5}{7} * v22 + \frac{4}{7} * v23 + \frac{3}{7} * v24 + \frac{2}{7} * v25 + \frac{1}{7} * v26) / 4$$

iii. Is physical abuse a concern for workers in this factory?

$$\text{physical Abuse concern} = 100 * (1 * v27 + \frac{6}{7} * v28 + \frac{5}{7} * v29 + \frac{4}{7} * v30 + \frac{3}{7} * v31 + \frac{2}{7} * v32 + \frac{1}{7} * v33) / 4$$

iv. Over the last year, have you been denied permission to use the toilet during work hours?

1) Never 2) Occasionally 3) Frequently 4) Always

“Never” is given a weight of 1 and “Always” is weighed in at 0, while intermediate answers are given incremental weights of 33.3.

Recode v34 (1 = 100) (2 = 66.7) (3 = 33.3) (4 = 0)

v. How often do you get a drink of water while you are at work?

1) Hourly or more 2) Every 2 hours 3) Every 3 or 4 hours 4) A couple of times a workday
5) Only during lunch dinner and breaks 6) Never

“Hourly or more” is given a weight of 1 and “Never” is weighed in at 0, while intermediate answers are given incremental weights of 20.

recode v35 (1 = 100) (2 = 80) (3 = 60) (4 = 40) (5 = 20) (6 = 0)

These variables are then averaged to create the ‘abuse’ heuristic index for the worker survey.

Worker abuse = rowmean (clock concern, verbal abuse concern, physical abuse concern, v27, v28)

4.4 *Principal Component Analysis*

There is substantial conceptual and empirical overlap among the heuristic indices and principal component analysis is used to uncover the factor structure behind those indices. Jolliffe (2002:1) states that “[t]he central idea of principal component analysis is to reduce the dimensionality of a data set consisting of a large number of interrelated variables, while retaining as much as possible the variation present in the data set. This is achieved by transforming to a new set of variables, the principal components, which are uncorrelated, and which are ordered so that the first *few* retain most of the variation present in *all* of the original variables.”⁸ Principle components analysis generates two underlying factors for each survey as shown below in table 2.

⁸ Principal Component Analysis, 2nd ed, Springer (2002)

Table 2: Principal Component Analysis for the HR survey

Variable	Factor 1	Factor 2	Uniqueness
Compensation	-0.1072	0.7494	0.4270
Training	0.2074	0.2764	0.8806
Abuse	0.8291	0.0240	0.3120
Freedom of Association and Collective Bargaining	-0.3575	0.2851	0.7909
Occupational Safety and Health	0.7966	0.0235	0.3468
Screening	0.1761	0.7172	0.4546

The two components for the HR survey are labeled HR innovations (HR Innov1 and HR Innov2).

HR Innov1 is composed of Compensation, Training, Freedom of Association and Collective Bargaining and Screening.

HR Innov2 is composed of Abuse and Occupational Safety and Health.

The first category of innovation captures the progression of a firm from the sweatshop stage to a more humane and or formal mode of organizing the workplace. From the perspective of management, formalization involves paying the worker higher wages, providing them with more opportunities for upward mobility and other benefits. Workers are trained more comprehensively and the improved working conditions are likely to elicit greater effort from the workers. Both contribute to increased worker productivity. At this stage, firms also become more rigorous in evaluating the workers' skill sets before hiring or promoting them. Furthermore, the workers are allowed to have union representation.

The second type of innovation may be more costly to implement or require fundamental changes in factory organization. Significant investments are usually required for firms to become compliant with international occupational safety and health standards. Similarly, changing factory culture that eliminates verbal and physical abuse may require significant investments in supervisor training.

Principle components analysis is also applied to the worker survey identify the following underlying factors:

WS Innov1 is composed of Compensation, Training, Abuse and Screening

WS Innov2 is composed of Freedom of Association and Collective Bargaining and Occupational Safety and Health.

Table 3: Principal Component Analysis for the Worker survey

Variable	Factor 1	Factor 2	Uniqueness
Compensation	0.6808	0.1363	0.5179
Training	0.6919	-0.1485	0.4992
Abuse	0.6270	0.0511	0.6043
Freedom of Association and Collective Bargaining	0.0411	0.7560	0.4268
Occupational Safety and Health	-0.0250	0.7823	0.3874
Screening	0.1982	0.1792	0.9286

The levels of innovations are similar for both surveys except for freedom of association and ‘collective bargaining’ and ‘abuse’ being switched around in the 2 innovation categories. However, we note that the factor loadings for ‘compensation’, ‘training’ and ‘screening’ are quite different for the HR and worker survey even though they are aggregated into the same factor for both surveys. This indicates that the HR systems that management believes it is implementing are markedly different from worker perceptions.

4.5 *Missing data and Heuristic Index Construction*

In the course of the survey, respondents are always offered the option of refusing to answer, thus generating problems with missing data. A variety of techniques are used to address missing data. First, when constructing the ‘compensation concern’ cluster index, the workers’ responses to the questions addressing the various types of concerns related to compensation are used as proxies for equivalent missing HR manager data. The same approach was used for creating the ‘abuse’ index for the HR survey.

Regressing average wages reported by the HR manager against individual wages reported by the workers allows for the estimation of a relationship between the two variables, thus filling in missing HR wage data. Regressing worker survey wage data on HR manager survey wage data yields the following relationship:

$$\text{HR wage} = (0.02 * \text{ws wage}) + 275,9587 \quad (14)$$

A similar approach was used to fill in missing data for the TET bonus variable.

$$\text{HR tet} = (0.18 * \text{ws tet}) + 1,836,350 \quad (15)$$

4.6 Regression Equations

The regression equations, equation (13) and (14) are estimated using two specifications. In the first set, indicators of the HR system are based on worker perceptions and in the second set, indicators are taken from the perception of factory HR manager. The first regression in each set uses HR systems components generated by the heuristic index, while the second equation uses the HR systems as characterized by the principal components methodology. The remaining variables used in the regressions are defined as follows.

4.6.1 Profits

Profits = Revenue – Total Cost

= Sales – Employee cost - Production cost - Aggregate worker compensation - TET bonus - Cost of raw materials & intermediate goods - Cost of electricity - Cost of communication services - Cost of fuel - Cost of transportation

Note that all the variables above have been annualized, except for the ‘TET bonus’ which is a single annual payment.

4.6.2 *Total wage*

Total wage is the sum of the annualized wages and the one time TET payment

4.6.3 *Price of Output*

The price per piece of garment sold is obtained by dividing revenues by the number of pieces of garment manufactured.

4.6.4 *Economies of scale*

The presence of economies of scale is indicated as a decline in the cost per unit of output. For the purposes of this analysis, the 'economies of scale' variable is defined as the cost per unit of output and is generated by multiplying the quotient of total cost and typical monthly output by 100. An increase in 'economies of scale' corresponds to a decrease in cost per unit of output.

4.6.5 *Categorizing the buyers*

The apparel factory customers vary across several dimensions. The analysis focuses specifically on the reputation sensitivity of the buyer and the quality of the product under production. Given, the range of factories in the data set, three main customer types emerge: (1) Reputation sensitive customers buying quality products, (2) Reputation sensitive customers who are mass merchandisers and (3) Customers who are not reputation sensitive. Reputation sensitivity is demonstrated by a commitment to a corporate social responsibility (CSR) program. The reputation sensitive buyers distinguish themselves from each other in terms of the volume and quality of products they purchase. Dummy variables are created for each category of buyers and the excluded group is mass merchandisers lacking a reputation-sensitive customer.

4.6.6 *Supply Chain Position*

A second firm characteristic concerns their position in the supply chain. Firms were asked about their position along the supply chain with respect to their primary buyer. The options were 'preferred supplier', 'contractor' or 'subcontractor' and they were coded as dummy variables, with 'subcontractor' being chosen as the excluded group.

4.6.7 Type of Garment

The complexity of products being manufactured varies widely. An underwear is the least complex piece of garment while a suit is the most complex.

Definitions of variables that used in Chapter 5 are summarized in Table 4.

Table 4: Description of Variables

Variable	Name
Π	Profits
wage	Total wage
price	Revenue per unit of garment
comp	Compensation
train	Training
foacba	Freedom of Association and Collective Bargaining Agreement
osh	Occupational Safety and Health
eos	Economies of Scale
RSQ	Reputation Sensitive - Quality
RSM	Reputation Sensitive - Mass
prefsup	Preferred Supplier

Chapter 5. Empirical Results

5.1 Regression Results

The heuristic formulation of HR practices is estimated according to equation (13) and the principle components formulation in equation (16). Equation (13) had comp as HRS₁, train as HRS₂, abuse as HRS₃, foacba as HRS₄, osh and HRS₅ and screen as HRS₆ and is not repeated here.

$$\begin{aligned}
 \text{Pr ofits} = & \beta_0 + \beta_1 \ln(\text{wage}) + \beta_2 \ln(\text{price}) + \beta_3 [\ln(\text{wage})]^2 + \beta_4 [\ln(\text{price})]^2 + \\
 & \beta_5 \ln(\text{innov1}) + \beta_6 \ln(\text{innov2}) + \beta_7 [\ln(\text{innov1} * \text{innov2})]^2 + \\
 & \beta_9 \ln(\text{price}) * \ln(\text{innov1}) + \beta_{10} \ln(\text{price}) * \ln(\text{innov2}) + \\
 & \beta_{11} \ln(\text{wage}) * \ln(\text{innov1}) + \beta_{12} \ln(\text{wage}) * \ln(\text{innov2}) \\
 & + \beta_{13} \ln(\text{price}) * \ln(\text{wage}) + \beta_{14} \ln(\text{pants}) + \beta_{15} \ln(\text{skirts}) + \\
 & \beta_{16} \ln(\text{dresses}) + \beta_{17} \ln(\text{jackets}) + \beta_{18} \ln(\text{suits}) + \beta_{19} \ln(\text{undergarments}) \\
 & + \beta_{20} \ln(\text{socks_hats_ties}) + \beta_{21} \ln(\text{other}) + \beta_{22} \ln(\text{eos}) + \beta_{23} \ln(\text{RS_Q}) \\
 & + \beta_{24} \ln(\text{RS_M}) + \beta_{25} \ln(\text{prefup}) + \beta_{26} \ln(\text{contractor}) + C
 \end{aligned}$$

(16)

The coefficient estimates are reported in Table 5.

Table 5: Regression Results

	HR Survey		Worker Survey	
	coeff		coeff	
comp	0.00	**	0.44	**
train	3.78	**	0.07	
abuse	17.28	**	1.14	**
foacba	5.94	**	0.51	
osh	-9.21	**	-0.03	
screen	0.07	**	-0.10	

innov1	-8.79	**	0.74	
innov2	-3.27	**	-0.24	
pants	12.12	**	-2.70	**
skirts	-14.86	**	0.89	**
dresses	3.81	**	-0.09	
jackets	2.86	**	-0.38	**
suits	-0.05	**	0.94	**
undergarments	-4.34	**	-1.04	**
socks_hats_ties	2.09	**	-0.44	**
other	0.06	**	0.19	
eos	-0.94	**	-0.05	**
RS_Q	-7.67	**	0.37	**
RS_M	-8.11	**	0.23	
prefsup	3.82	**	-0.72	**
contractor	5.55	**	-0.76	**
_cons	29.83	**	17.70	

**significant at 5%level

Table 6: Hypothesis Tests

HR Practice	Hypothesis 1	Hypothesis 2
comp	Holds	Holds
train	Holds	Does not Hold
abuse	Holds	Does not Hold
foacba	Holds	Does not Hold

osh	Does not Hold	Holds
screen	Holds	Does not Hold
innov1	Does not Hold	Holds
innov2	Does not Hold	Holds

Compensation

The positive coefficient of elasticity both on the compensation variable indicates that both workers and managers perceive that fair compensation of workers have a positive impact on profits. Firms that inform workers about pay procedures and pay workers as promised earn higher profits than other firms. Such a finding is consistent with hypothesis 1.

Further, the fact that the elasticity from the worker perspective (0.44) is larger than from the HR manager's perspective (0.00) indicates that clarity of pay procedures only increases profits if the worker perceives the practice. Such an outcome is consistent with hypothesis 2.

Training

Ichnioswki et al. find that multi dimensional increases productivity. The positive coefficient on train goes one step further to indicate that training not only increases productivity but it also increases profits. The large difference in coefficient from the manager's perspective (3.78) and the workers' perspective (0.07) the training efforts by managers are effective even though they may not be perceived by the worker. It should be noted that training id insignificant from the worker's perspective. Supervisory skills training provides an example. Workers may be unaware that such training is occurring but benefit with supervisors have improved labor management skills.

Abuse

Comp and abuse when considered together perfectly characterize exploitative practices. When employers do not pay what they say they are going to pay, the only way they can elicit effort for the workers is in being abusive. The positive coefficient of elasticity both from HR's perspective and the worker's perspective indicates paying as promised is more profitable than the sweatshop practice of failing to pay as promised while eliciting work effort through aggressive verbal exhortation.

Osh

The most dramatic contrast between worker and manager perceptions includes Occupational Safety and Health. For both managers (-9.21) and workers (-0.03), an increase in OSH is associated with a fall in profits. As with other aspects of the HR package, the fact that the estimated coefficient for the manager is smaller than for workers indicates a failure of the managers to implement OSH improvements most valued by workers. It should be noted that the OSH coefficient is not significant from the worker's perspective. Nevertheless, the results are consistent with the conclusion that the value workers place on improved OSH is not sufficient to warrant the investment

Screen and Train

Management views screening of employees to choose the most competent ones and training the employees to make them more competent as profit enhancing. As such the first hypothesis holds but the second hypothesis does not hold as the workers view the implementation of those HR practices as being less profitable or even profit decreasing. It should be noted that the worker variables are not significant.

Innovation Variables

Ln_innov2 is the factor which consists of the comp factor for the HR survey and Ln_innov1 is the factor which consists of comp for the worker survey. They both are positive but we cannot say much on the impact on the individual contribution of the comp variable on the profit variable

Chapter 6

Conclusion and Directions for Future Research

The central question of this thesis is whether innovations in working conditions increase firm profits. Are exploitative practices profitable? The results indicate that less worker abuse leads to higher profits *ceteris paribus*, thus supporting the business case for humane labor management practices. In particular, the positive productivity effect of transparent pay practices is contrasted with the negative effects of diminished monopsonistic exploitation. The empirical results provide evidence consistent with the hypotheses that there is cross-firm heterogeneity in managerial quality and that higher quality managers choose more humane and profitable labor management practices.

Further, the challenges of implementing HR innovations are a significant factor in deterring their adoption. Labor management innovations that HR managers believe they are introducing have a smaller impact on profits than when workers perceive a change in working conditions. That is, a one unit change in working conditions as perceived by the worker on firm profits is larger than a one unit change in working conditions as perceived by the manager. As a consequence, most innovations require effective implementation at the factory floor to improve profitability.

The regression results indicate markedly different perspective of the managers relative to that of the workers. Workers apparently fail to perceive changes in HR systems implemented by management. One unexpected finding however is the positive correlation between the second level of innovation in the HR manager's survey and profits. For example, achieving compliance with OSH regulations is often requires expensive investments that do not produce a commensurate increase in productivity or reduction in wages.

The analysis presented above, while suggestive, is not definitive. It remains possible that profits and the HR system are jointly determined by a third factor not included in the analysis. A second question concerns the fidelity with which managers and workers report on their workplace perspectives.

A third perspective is offered by Assessments of compliance with working conditions standards undertaken by the International Labor Organization.

APPENDIX

Section A

The steps required to derive Equation (11) from Equation (10) are detailed here.

From Young's Theorem,

$$\sum_i \sum_j \frac{\prod_{p_i w_j} (p_i, w_j; I_k)(p_i)(w_j)}{2!} = \sum_j \sum_i \frac{\prod_{w_j p_i} (p_i, w_j; I_k)(w_j)(p_i)}{2!}$$

$$\sum_i \sum_k \frac{\prod_{p_i I_k} (p_i, w_j; I_k)(p_i)(I_k)}{2!} = \sum_k \sum_i \frac{\prod_{I_k p_i} (p_i, w_j; I_k)(I_k)(p_i)}{2!}$$

$$\sum_j \sum_k \frac{\prod_{w_j I_k} (p_i, w_j; I_k)(w_j)(I_k)}{2!} = \sum_k \sum_j \frac{\prod_{I_k w_j} (p_i, w_j; I_k)(I_k)(w_j)}{2!}$$

Hence,

$$\sum_i \sum_j \frac{\prod_{p_i w_j} (p_i, w_j; I_k)(p_i)(w_j)}{2!} + \sum_j \sum_i \frac{\prod_{w_j p_i} (p_i, w_j; I_k)(w_j)(p_i)}{2!} = \sum_i \sum_j \prod_{p_i w_j} (p_i, w_j; I_k)(p_i)(w_j)$$

$$\sum_i \sum_k \frac{\prod_{p_i I_k} (p_i, w_j; I_k)(p_i)(I_k)}{2!} + \sum_k \sum_i \frac{\prod_{I_k p_i} (p_i, w_j; I_k)(I_k)(p_i)}{2!} = \sum_i \sum_k \prod_{p_i I_k} (p_i, w_j; I_k)(p_i)(I_k)$$

$$\sum_j \sum_k \frac{\prod_{w_j I_k} (p_i, w_j; I_k)(w_j)(I_k)}{2!} + \sum_k \sum_j \frac{\prod_{I_k w_j} (p_i, w_j; I_k)(I_k)(w_j)}{2!} = \sum_j \sum_k \kappa_{jk} (p_i, w_j; I_k)(w_j)(I_k)$$

Section B

The list of question used to construct the HR heuristic indices is provided below.

1. Compensation

HR Survey	Sub Cluster
What is the typical monthly pay and benefits for a sewer in this factory?	Monetary Compensation
What was the TET bonus this year for a typical sewer in this factory?	Monetary Compensation
What percent of current supervisors were promoted from production positions within this establishment?	Promotions
What percent of current sewers were promoted from lower skilled positions within this establishment?	Promotions
Does this factory provide production employees housing?	Benefits
Which of the following benefits are provided to production workers at this facility?	Benefits
Is the piece rate a concern for workers in this factory?	Pay Practices
Is the late payment of wages a concern for workers in this factory?	Pay Practices
Are excessive deductions from wages a concern for workers in this factory?	Pay Practices
Is too much in-kind compensation a concern for workers in this factory?	Pay Practices
Are too low wages a concern for workers in this factory?	Pay Practices
Is TET bonus too small a concern for workers in this factory?	Pay Practices

Worker Survey	Sub Cluster
How much was your TET bonus this year?	Monetary Compensation
Is the piece rate a concern for workers in this factory?	Monetary Compensation
Is late payment of wages a concern for workers in this factory?	Pay Practices
Are excessive deductions from wages a concern for workers in this factory?	Pay Practices
Is the amount of in-kind compensation a concern for workers in this factory?	Pay Practices
Are low wages a concern for workers in this factory?	Pay Practices
Is the size of the TET bonus a concern for workers in this factory?	Pay Practices
Below is a list of some workplace benefits. Check all the benefits that are available in this factory	Benefits
Do you need financial support from your parents or other people in your family?	Financial Independence
Do you send or give money to your parents or other family members?	Financial Independence

2. Training

HR Survey

Which topics are discussed in induction training?

How much time is spent on basic skills training for a typical new employee?

How much time does such training require?

What percent of sewers working in this factory have received training in new sewing skills in the last three months?

What percent of the sewers working in this factory have received new training in quality control in the last three months?

What percent of the sewers working in this factory have received new training in grievance procedures in the last three months?

Worker Survey

Did you receive any training the first month you worked in this factory?

What types of training did you receive when you first started working in this factory?

3. Abuse

HR Survey

Is a broken or inaccurate punch clock a concern for workers in this factory?

Is verbal abuse such as yelling or use of vulgar language a concern in this factory?

Is physical abuse such as hitting or shoving a concern in this factory?

Worker Survey

Is a broken or inaccurate punch clock a concern for workers in this factory?

Is verbal abuse such as yelling or use of vulgar language a concern for workers in this factory?

Is physical abuse such as hitting or shoving a concern for workers in this factory?

Over the last year, have you been denied permission to use the factory toilet during work hours?

How often do you get a drink of water while you are at work?

4. Freedom of Association and Collective Bargaining Agreement

HR Survey	Sub Cluster
Does this establishment have a collective bargaining agreement?	Presence
Does this factory have a trade union representative?	Presence
Does this factory have any worker committees?	Presence
What issues are covered by the collective bargaining agreement?	Effectiveness
If this factory were having a conflict between managers and workers, how effective do you think a trade union representative would be in helping resolve the conflict?	Effectiveness
If this factory were having a conflict between managers and workers, how effective do you think a worker committee would be in helping resolve the conflict?	Effectiveness

Worker Survey

Are you represented by a collective bargaining agreement that you know of?
 If you were having a problem at work, how comfortable would you feel seeking help from the trade union representative?

5. Occupational Safety and Health

HR Survey

Do workers think the factory too hot or too cold?
 Are workers concerned about dangerous equipment or machinery?
 Are workers concerned about Accidents or injuries?
 Are workers concerned about Dusty or polluted air?
 Are workers concerned about Bad chemical smells in the factory?

Worker Survey

Worker Survey	Sub Cluster
We are going to list some workplace facilities.	Facilities
If "Canteen" selected: How satisfied are you with the food in the canteen?	Quality of services
How satisfied are you with the bathrooms in the factory?	Quality of services
How satisfied are you with Drinking water in the factory?	Quality of services
Are workers concerned that this factory is too hot or too cold?	Health concerns
Are workers concerned about dangerous equipment or machinery?	Health concerns
Are workers concerned about accidents or injuries in this factory?	Health concerns
Are workers concerned about dusty or polluted air in this factory?	Health concerns
Are workers concerned about bad chemical smells in the factory?	Health concerns

6. Screening

HR Survey

Are any tests given to applicants for a sewing job?

Are any tests given to applicants for a supervisor job?

How often are sewers in this establishment evaluated for performance, promotion and/or pay rate change?

Worker Survey

What is your highest level of education?

How would you rate your skill level?

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